

EXECUTIVE SUMMARY

Superior Refining Company was shutting down in preparation for a plant turnaround on Thursday, April 26, 2018, when two absorber vessels in the gas concentration unit of the refinery exploded. The explosion resulted in injuries to 36 Superior Refining Company employees and contractors at the refinery.

Following the explosion Superior Refining Company's Emergency Response Team (ERT) was able to extinguish an ensuing fire in the area. However, the explosion also sent debris, including metal pieces of the vessels into the surrounding area. One projectile hit an asphalt storage tank, penetrating the metal tank and releasing hot asphalt, which continued flowing from the tank after the first fire was extinguished.

When the asphalt level in the tank lowered to where air could enter the tank, an asphalt fire began, starting from the hole and following the asphalt spill locations. This fire continued for hours after the initial explosion and fire, and led to multiple explosions from drums and small tanks located in the areas around the spilled asphalt. Emergency response teams from the site and from the surrounding communities were ultimately able to extinguish the fire. No ERT members were injured during the response.

The HRT proposes 12 findings and 5 recommendations based on this inspection, in accordance with the following OSHA and industry standards and recommended practices.

- 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals
- American Petroleum Institute (API) 510, Pressure Vessel Inspection Code: In-service Inspection, Rating, Repair and Alteration, 2014
- API 520, Sizing, Selection, and Installation of Pressure-relieving Devices, 2014
- API 521, Pressure-relieving and Depressuring Systems, 2014
- API 537, Flare Details for Petroleum, Petrochemical, And Natural Gas Industries, 2017
- API 570, Piping Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems, 2016
- American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC), 2017
- ASME BPVC, 1968
- API 579-1/ASME FFS-1, Fitness-For-Service, 2016
- National Board Inspection Code (NBIC), Part 2, Inspection, 2013.